
All's well that ends well: alternative polyadenylation and its implications for stem cell biology.

Journal: Curr Opin Cell Biol

Publication Year: 2013

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PubMed link: 23357469

Funding Grants: Stanford CIRM Training Program

Public Summary:

The activity and behavior of stem cells is governed by a complex network of molecular pathways. At the heart of these pathways are the genes from DNA that code for the large molecules that act in this network. One way to regulate these networks is simply for the cell to control the quantity of product produced by individual genes. Recent work, however, has also shown that the same gene can code for different products depending on how that gene is read. In this review, we focus on a type of molecular regulation called alternative polyadenylation, which controls the length of the product, and discuss the impact of this process on stem cell biology as well as areas for future research.

Scientific Abstract:

Stem cell quiescence, activation, and differentiation are governed by a complex network of molecular pathways. There has been a growing recognition that posttranscriptional modifications, such as alternative polyadenylation (APA) of transcripts, play an important role in regulating gene expression and function. Recent analyses of stem cell populations have suggested that APA controls stem cell fate and behavior. Here, we review recent developments that have shaped our understanding of the control of stem cell behavior by APA and we highlight promising areas for future investigation.

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